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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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(54) Title: PROCESS FOR INCREASING RSV SURFACE GLYCOPROTEIN YIELDS USING A MUTANT STRAIN OF RSV

(57) Abstract: A process for producing isolated and purified respiratory syncytial virus (RSV) fusion (F) and attachment (G) glycoproteins in eukaryotic cell cultures infected with RSV cold-passaged, temperature-sensitive mutant subgroup A2 strain *cpts*-248/404 results in at least a 5-fold increase in F and G protein yields when compared with the parent A2 strain. Immunogenic compositions comprising the F and/or G protein(s) produced by this process can be formulated for *in vivo* administration to a host to confer protection against disease caused by RSV.



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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C07K14/135 A61K39/155

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 $\begin{array}{ll} \mbox{Minimum documentation searched (classification system followed by classification symbols)} \\ \mbox{IPC 7} & \mbox{C07K} & \mbox{A61K} \end{array}$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, MEDLINE, EMBASE, PAJ

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	HANCOCK GERALD E ET AL: "Serum neutralizing antibody titers of seropositive chimpanzees immunized with vaccines coformulated with natural fusion and attachment proteins of respiratory syncytial virus" JOURNAL OF INFECTIOUS DISEASES, vol. 181, no. 5, May 2000 (2000-05), pages 1768-1771, XP002303541 ISSN: 0022-1899 abstract page 1769, left-hand column, paragraphs 1,2	1-18

Further documents are listed in the continuation of box C.	X Patent family members are listed in annex.
Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed Date of the actual completion of the international search	 *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family Date of mailing of the international search report
2 November 2004	26/11/2004
Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentiaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Grötzinger, T
orm PCT/ISA/210 (second sheet) (January 2004)	

INTERNATIONAL SEARCH REPORT

International Application No T/US2004/008028

L STAGGE 9	C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT Category Citation of document, with indication, where appropriate of the relevant							
- Calegory	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.						
X	FIRESTONE C-Y ET AL: "NUCLEOTIDE SEQUENCE ANALYSIS OF THE RESPIRATORY SUNCYTIAL VIRUS SUBGROUP A COLD-PASSAGED (CP) TEMPERATURE SENSITIVE (TS) 248/404 LIVE ATTENUATED VIRUS VACCINE CANDIDATE" VIROLOGY, ACADEMIC PRESS,ORLANDO, US, vol. 225, no. 2, 15 November 1996 (1996-11-15), pages 419-422, XP002047455 ISSN: 0042-6822 abstract page 421; tables 1,2	1-6, 8-13, 15-18						
X	WO 98/02457 A (CONNAUGHT LAB; CATES GEORGE A (CA); KLEIN MICHEL H (CA); OOMEN RAYMON) 22 January 1998 (1998-01-22) abstract page 10, line 15 - line 30 pages 20-22; examples 2,3 claims	4–17						
	US 5 922 326 A (CONNORS MARK ET AL) 13 July 1999 (1999-07-13) abstract claims	1-3,18						

INTERNATIONAL SEARCH REPORT

International Application No International Application No International Application No

		 _	/US2	TFI/US2004/008028	
Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9802457	A	22-01-1998	US AU BR CA CO CN DE EP NZ US US	6020182 A 716378 B2 3431197 A 9712970 A 2259594 A1 2436126 A1 9802457 A1 1230197 A ,B 942928 T1 0942928 A1 2141065 T1 2000501418 T 334115 A 6309649 B1	01-02-2000 24-02-2000 09-02-1998 28-08-2001 22-01-1998 22-01-1998 22-01-1998 22-01-1999 02-03-2000 22-09-1999 16-03-2000 08-02-2000 23-06-2000 30-10-2001
US 5922326	A	13-07-1999	US US AU AU DE ES HULP RNZ PU BR BR BA	5882651 A 6284254 B1 181359 T 683840 B2 4290793 A 2118509 A1 69325370 D1 69325370 T2 640128 T3 0640128 A1 2132233 T3 3031208 T3 69992 A2 105456 A 7505891 T 257171 B1 9302278 A1 252857 A 172087 B1 2139729 C1 9321310 A1 1100531 A3 9302766 A	26-09-2002 16-03-1999 04-09-2001 15-07-1999 27-11-1997 18-11-1993 28-10-1993 22-07-1999 14-10-1999 22-11-1999 01-03-1995 16-08-1999 31-12-1996 29-06-1995 15-05-2000 29-07-1994 24-06-1997 31-07-1997 20-10-1999 28-10-1993 01-08-2000 20-10-1994